

REMARKS

Petition for Extension of Time Under 37 CFR 1.136(a)

It is hereby requested that the term to respond to the Examiner's Action of May 13, 2008 be extended one month, from August 13, 2008 to September 15, 2008 (September 13 being a Saturday).

The Commissioner is hereby authorized to charge the RCE filing fee, extension fee, and any additional fees associated with this communication to Deposit Account No. 50-4364.

In the Office Action, the Examiner indicated that claims 1 through 15 are pending in the application and the Examiner rejected all claims. Applicant has cancelled all pending claims, and added new claims 16 to 30. Applicant notes that the claims were added as new claims for simplicity; currently pending claims 16-30 correspond to modified versions of claims 1-15, respectively.

The Present Invention Is Patentable over Youlton

In the response to the First Office Action, applicant noted that the invention covers a wave energy device that is 'heave-resistant' and has multiple oscillating water columns that each resonate at different wave periods (or, equivalently, wave frequencies). Applicant argued that US 5770893 (Youlton/Embley) is **not heave-resistant** at all and that it actually **must** heave (i.e. rise and fall with the waves) in order to operate properly.

The Examiner argued in response as follows:

“Please note that “heave resistance” does not mean “non-heave”. On page 2, lines 17 -23, Applicant clearly discloses that “heave resistance” can be achieved by tethering the system to the sea bed and the system may rise and fall with tidal activity. Youlton clearly teaches that concept on column 7, lines 47 -55.”

The Examiner has, however, interpreted the specification incorrectly. Applicant nowhere says that “heave resistance” can be achieved by tethering the system to the sea bed.

The relevant section in the specification reads as follows:

“The heave-resistance of the vessel can be achieved in various ways. For example, the vessel may be tethered **under tension** to, say, the sea bed. If necessary or desired, the tethering system can have sufficient elasticity to allow the vessel to rise and fall with tidal activity.”

So Applicant teaches that heave resistance can be provided by a tether to the sea bed, but, critically, it has to be a tether under **tension**. As a further refinement, the tether can be designed with sufficient elasticity to allow the vessel to rise and fall on the tide.

Youlton nowhere discloses or suggests the use of **tension** mooring. In particular, the section referenced by the examiner, column 7 lines 47 – 55, nowhere discloses or suggests the use of **tension** mooring and hence nowhere implicitly or explicitly teaches or suggests a heave resistant vessel. Instead, it merely states:

“They could be moored by direct sea anchor, by catenary or rigid or fixed links to adjacent mooring buoys or other adjacent devices, by shore based lines, by attachment to shore or seabed anchored spines, by streaming from or containment within seabed based structures or from or within mobile vessels or oil rigs”

Nothing in this list teaches or suggests the use of a tension mooring. Nothing in this list implicitly leads to a heave resistant device and most of the items listed inevitably very clearly

lead to the Youlton device NOT being heave resistant – for example, a sea anchor does not give heave resistance; any kind of link to adjacent buoys does not give heave resistance; shore based lines do not give heave resistance.

In fact, as applicant has explained in detail in the response to the first Office Action, the Youlton device **cannot be heave resistant** because it will not work if it is made heave resistant. Applicant adopts the arguments given in the first response for support for the position that Youlton is not heave resistant.

Applicant will briefly expand on those arguments. Youlton discloses a wave energy device with tubes that are “generally disposed **below** the effective wave base” (See Abstract). Because the bottom of the tubes are below the effective wave base, there is no pressure head at the base of a tube when a wave is passing the device. When a wave passes the device, the buoy heaves upwards, but the water column in a tube does not rise in absolute terms because there is no pressure head at the tube base. Because the buoy heaves *upward*, the water column in the tube moves *down* relative to the buoy. It is this relative movement of the water column in each tube that drives the air movement in each tube. But it requires the buoy to heave.

Applicant has made this difference in operation explicit by reciting, in the amended independent claim 16, that the bottom of each chamber in the present invention is *above* the wave base. It has to be above the wave base, because the specification states that “As a wave crest approaches the device 10, the water level 32 within chamber 26 rises....” (page 7, line 19 of the PCT publication). This only happens if the bottom of the chamber is above the wave base.

Modifying Youlton to use a tension mooring is therefore not something the skilled implementer would ever do since it would defeat the primary design objective of Youlton, which

is to heave. Modifying Youlton so that the bottom of each chamber is *above* the wave base is also not something the skilled implementer would ever do since the correct operation of the Youlton device requires the bottom of each chamber to be *below* the wave base.

**The Present Invention Is Patentable over Hagen**

Hagen also fails to teach or suggest the use of a **tension** mooring line. The Examiner cites cables 15 in Figure 2 on this point. But the cables 15 in Figure 2 are clearly conventional catenary lines – these are not tension lines at all. And in any event, the cables 15 are not directly connected to the floating platform 11. Instead, they merely connect to a floating monobuoy 14. Floating platform 11 connects with the monobuoy using horizontal mooring lines 13b. So cables 15 are completely irrelevant to whether the floating platform is a heave resistant vessel, as required by Claim 16. There is therefore no basis for the position that floating platform 11 is heave resistant.

Applicant therefore adopts the arguments given in the first response for further support for the position that Youlton is not heave resistant.

In addition, the Hagen design must be oriented to face incident waves:

“floating platform means having a front side and a lea side, and containing a plurality of wave energy collection means arranged to receive waves advancing generally towards said front side...”

Claim 16 of the present invention defines a device that does NOT have to be oriented to face incident waves (“in which at least some chambers differ from others by being designed to resonate at different incident wave frequencies, irrespective of the orientation of the device in relation to incident waves”).

Finally, in the response to the first Office Action, applicant also argued that:

“Hagen also lacks any explicit teaching of having different draughts that tune the system to resonate at different wave *periods*: it instead suggests that the different draughts are tuned to work at different wave ‘sizes’:

“The wave energy collecting cells vary in depth for various wave *sizes*” col 2 line23 – 24.

But the term ‘sizes’ is used in this field to refer to *height*, and *not* period. Wave height is not correlated with wave period.”

The Examiner has not addressed this argument at all, merely stating:

“The chambers in Hagen...clearly have different draughts depending on different wave periodicity”

But there is no support whatsoever for the Examiner’s conclusionary view. Hagen fails to teach or suggest having different draughts that tune the system to resonate at different wave *periods*.

The present claims are therefore both novel and inventive over both Youlton and Hagen.

### Conclusion

The present invention is not taught or suggested by the prior art. Accordingly, the Examiner is respectfully requested to reconsider and withdraw the rejection of the claims. An early Notice of Allowance is earnestly solicited.

The Commissioner is hereby authorized to charge any fees associated with this communication to applicant's Deposit Account No. 50-4364.

Respectfully submitted

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Date

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